

EXECUTIVE SUMMARY

This draft Biological Opinion (Opinion) evaluates the effects of the Environmental Protection Agency's (EPA's) proposed national registration review of atrazine on endangered and threatened species and designated critical habitat under U.S. Fish and Wildlife Service (Service) jurisdiction, in accordance with section 7(a)(2) of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 et seq.). This Opinion also serves as a conference report for proposed species and proposed critical habitats.

There are currently five technical registrants of atrazine that are considered applicants in this consultation: Syngenta, Drexel Chemical Company, Adama, INATEK, LLC, and Sipcam Agro. There are 175 registrations of products with atrazine as an active ingredient. Atrazine is registered for use as a pre- and post-emergence herbicide that is intended to control broadleaf and grassy weeds. Atrazine is registered for Section 3 use throughout the conterminous United States (CONUS) for the following agricultural use patterns: field corn, sweet corn, sorghum, sugarcane, macadamia nuts, guava, fallow crop lands, and turf production (sod farm). The special local needs registrations for atrazine allow use on sweet corn, turf production (sod farm), and sugar cane in Florida; on corn grown for silage in New York; and on sorghum in Oklahoma and Texas. Atrazine is also registered for Section 3 use on the following non-agricultural use patterns within CONUS: ornamental turfgrass sites, including residential lawns, school grounds, parks, playgrounds, and golf courses and other athletic fields. Atrazine use is not permitted in Alaska, Hawai'i, the United States territories, or California outside of Imperial County. Atrazine can be applied as a liquid formulation for all crops as well as a granule formulation for turf. Atrazine may be applied by ground or aerial applications, which may occur at different times throughout the year including multiple applications to the same crop.

Atrazine registrants previously modified product labels to narrow the geographic scope where atrazine can be used and to require applicators to implement several conservation measures to limit the extent of atrazine off-site transport and exposure to the environment (i.e., spray drift and runoff). Through consultation with EPA, we identified the need for additional conservation measures to further minimize adverse effects to many listed species. As such, the technical registrants have committed to adopting additional conservation measures as identified using EPA's Herbicide Strategy, including a 15-foot spray drift ground buffer, 170-foot aerial buffer, and a minimum of three runoff mitigation points that are required for all agricultural uses in all locations where atrazine is registered for use, as well as additional measures related to application rates and timing for particular registered uses. EPA estimates these measures will further reduce the extent of listed species habitat that will be exposed to atrazine and reduce exposure concentrations by 90-95%, minimizing adverse effects to many listed species. For listed species that, after incorporating these general label measures, we determined there was still a substantial risk of adverse effects, the registrants have committed to requiring an additional three runoff mitigation points (i.e., six points total) to further reduce exposure to those species. These additional measures will reduce exposure concentrations by up to 99% (i.e., two orders of magnitude) and contribute to reducing the risk of adverse effects. EPA will communicate where and for what specific atrazine uses these additional runoff measures are required through their Bulletins Live! Two online platform.

Our analysis of the effects of the action considered the information on the atrazine label and supplemental information that we received from EPA and the technical registrants, including conservation measures committed to by registrants prior to and during this consultation. In this draft Biological and Conference Opinion, we addressed 530 proposed and listed species and 195 designated and proposed critical habitats. We concurred with EPA's determinations that the proposed action may affect, but is not likely to adversely affect, 266 listed and proposed species and 140 designated and proposed critical habitats. EPA determined there would be no effect from the proposed action and we adopted this call for 844 listed species and 529 designated and proposed critical habitats, many of which were associated with geographic areas where atrazine is no longer registered for use (e.g., Hawai'i, Puerto Rico, and California outside of Imperial County). In an associated Concurrence Appendix (Appendix A), we described EPA's "no effect" determinations and our concurrence and agreement with EPA's "not likely to adversely affect" determinations. We also explained our reasonings behind including several species and critical habitats in our draft Biological Opinion instead of concurring with EPA's "not likely to adversely affect" determinations.

Analysis and Methods

We followed an ecological risk assessment framework to determine effects to species and their critical habitats. We used information presented in EPA's Biological Evaluation (BE) (e.g., pesticide exposure estimates and toxicological response data) and from the technical registrants, when applicable, to predict the resulting effects to species and critical habitats. We assessed toxicological effects related to the action, including anticipated general pathways of exposure to listed species taxa groups and their designated critical habitats (i.e., physical and biological features, or PBFs). We then described specific aspects of atrazine (e.g., chemical properties, applications rates, routes of exposure), its use on the landscape (e.g., different types of usage data), and how it will impact species and critical habitats based on these properties. We describe factors that influence exposure and effects and how we incorporated them into our analysis. Within the Integration and Synthesis section of the Opinion, we describe our approach to the analysis for each of the taxa groups, which includes incorporating all aspects of the potential exposure to atrazine for the different taxonomic groups within the context of the status of the species and critical habitat, environmental baseline, and cumulative effects.

For species that EPA determined were "likely to be adversely affected" by the proposed action or that the EPA determined were "not likely to be adversely affected" and we did not concur, we assessed the species' overall vulnerability and conducted a risk analysis. The risk analysis included metrics of exposure and expected magnitude of adverse effects. We used the percent overlap between the species' ranges and the action area (i.e., atrazine use sites and areas of off-site transport through spray drift or runoff). When available, we used metrics for past herbicide usage (i.e., U.S. Department of Agriculture's Census of Agriculture, CoA; and California's Department of Pesticide Registration's California Pesticide Use Report, CalPUR) and estimated atrazine usage (i.e., EPA's National and State Summary Use and Usage Matrix, SUUM) to assess potential future exposure to atrazine. Finally, we compared estimated environmental concentrations that EPA generated to reference toxicity thresholds to determine the expected magnitude of adverse effects to individuals and necessary resources, including critical habitat PBFs when applicable. Depending on the species, toxicological effects could be mortality, growth inhibition, reproduction loss, reduction in habitat, or prey loss. We used these pieces of

information to generate the anticipated risk of adverse effects for each species considered in this draft Opinion.

Results

Animals

In total, we considered 343 proposed and listed animals and 148 proposed and designated animal critical habitats in our Opinion that either EPA determined were likely to be adversely affected by the proposed action or that the EPA determined were "not likely to be adversely affected" and we did not concur. We do not expect atrazine to kill animals from acute exposure, but it may result in adverse sublethal effects. In both terrestrial and aquatic animals, toxicity studies indicate that atrazine may lead to growth and reproductive effects at a range of exposure concentrations. For more detail, see the *Effects of the Action on Animals* section of the Opinion. After considering the conservation measures incorporated into the action, extent of exposure, magnitude of expected impacts to individuals and their resources, vulnerability analysis, environmental baseline, and cumulative effects, we concluded that the proposed action is not likely to jeopardize 319 proposed or listed animal species and is not likely to destroy or adversely modify 137 proposed or designated critical habitats for animal species.

Plants

In total, we considered 187 listed plants and 47 proposed and designated plant critical habitats in our Opinion that either EPA determined were likely to be adversely affected by the proposed action or that the EPA determined were "not likely to be adversely affected" and we did not concur. Atrazine has demonstrated adverse effects on growth to plants, which is expected because atrazine is an herbicide. After considering the conservation measures incorporated into the action, extent of exposure, magnitude of expected impacts to individuals and their resources, vulnerability analysis, environmental baseline, and cumulative effects, we concluded that the proposed action is not likely to jeopardize 183 listed plant species and is not likely to destroy or adversely modify 46 proposed and designated critical habitats for plant species.

Conclusions

All species in this consultation and concurrence benefit from general label conservation measures. Some species in the consultation and concurrence were included in ed in Pesticide Use Limitation Areas (PULAs) to further reduce off-site transport for various reasons (e.g., their habitats are more likely to have high concentrations of atrazine), as noted in the appropriate appendices. In addition, we expect that for some species, implementation of conservation measures, including those on the general label and within species-specific PULAs, as applicable, will reduce atrazine exposure to a degree that we no longer expect any adverse effects to individuals; these species are noted in the concurrence (Appendix A) with their assigned PULA.

In our draft Biological Opinion, we focused our analyses on 1) species with low expected exposure to atrazine (due to low overlap, usage, or conservation measures adopted prior to consultation), and 2) species with more than low levels of exposure that benefited from conservation measures identified through the Herbicide Strategy that aimed to reduce off-site transport of atrazine (i.e., listed plants and listed animals that depend on plant resources).

Consideration of these measures in our analyses of species and critical habitats in this draft Opinion, which combines vulnerability and risk analyses with each species' environmental baseline and cumulative effects, was adequate to conclude that the proposed action is not likely to jeopardize 502 proposed or listed species or destroy or adversely modify 183 proposed or designated critical habitats. For 28 other listed and proposed species and 12 designated and proposed critical habitats, further analysis is required to determine the extent of effects, if any, and the resultant risk to these listed species. We intend to continue coordinating with EPA and atrazine registrants between the release of this draft Opinion and the transmission of the final Opinion to gain information regarding the exposure and effects of atrazine registration, as proposed, to these species and critical habitats. As such, we have not yet made determinations for these species or critical habitats.